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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/765,608	01/22/2001	Yoshinori Hayashi	202114US2	9741

7590 03/13/2002

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EXAMINER

PHAM, HAI CHI

ART UNIT

PAPER NUMBER

2861

DATE MAILED: 03/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/765,608

Applicant(s)

HAYASHI ET AL.

Examiner

Hai C Pham

Art Unit

2861

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2, 4-6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Figures 1 and 2 should be designated by a legend such as --PRIOR ART-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frazier et al. (U.S. 5,193,008) in view of Murata et al. (U.S. 5,365,258.)

Frazier et al. discloses an interleaving vertical pixel formation in a laser printer such that a dot is formed at a center between adjacent light fluxes as a result of the adjacent light fluxes being overlapped with one another in a sub-scan direction (the image dots between the scan lines being achieved by energizing two pixels directly above and directly below the desired interleaved dot with the energizations at both pixels being below the threshold level for producing a dot while the combined energization at the desired interleaved dot is higher than the threshold to produced the interleaved dot) (col. 3, line 43 to col. 4, line 41.)

Frazier et al. further teaches such laser printer including a photoconductive drum (not shown) along with a laser source (not shown) for emitting the light flux to scan the surface of the photoconductive drum to form the latent image, but Frazier et al. does not show the deflector, which is an inherent component of a raster-based laser printer taught by Frazier et al.

However, Frazier et al. fails to teach the relationship between the beam-spot diameter W_s in the sub-scan direction and the interval L between adjacent scan lines, as well as the relationship between the beam-spot diameter W_s in the sub-scan direction and the static beam-spot diameter W_m in a main scan direction.

Regardless, Murata et al. discloses an image forming apparatus, which includes a photosensitive body (4, Fig. 2,) and an optical scanning device having a deflector

(polygon mirror 2) deflecting a light flux emitted from a light source (semiconductor laser 1,) and scanning the surface of the photosensitive body by the thus-deflected light flux. Murata et al. further teaches a preferred laser beam spot on the surface of the photosensitive body being an ellipse for the purpose of increasing the potential contrast on the photoconductor as well as increasing the resolution of the formed image, with the spot diameter (q) of the laser beam in the sub-scanning direction, defined as a value obtaining $1/e^2$ the peak power of the laser beam, and the pitch (or interval) between the scan lines (p) satisfying the following ratio:

$$q / p = 1.6 \text{ through } 1.8 \quad (\text{col. 10, line 60 to col. 11, line 21})$$

which amply satisfies the claimed ratio.

Moreover, since the laser beam spot on the surface of the photosensitive body being an ellipse with the longer dimension being in the sub-scanning direction, the following relationship would hold:

$$q_m / q_s < 1$$

where q_m is the beam spot diameter in the main scanning direction and q_s is the beam spot diameter in the sub-scanning direction.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Frazier et al. with the aforementioned teaching of Murata et al. By doing so, it is possible to increase the potential contrast of the interleaved dot on the photoconductor as well as to increase the resolution of the formed image.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on (703) 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



HAI PHAM
PRIMARY EXAMINER
March 9, 2002